UNBRIDLED LEARNING
THE VISION FOR KENTUCKY'S FUTURE

GRADE

7

KENTUCKY

K-PREP

Kentucky Performance Rating For Educational Progress

MATH SAMPLE ITEMS

Spring 2012

EVERY CHILD
PROFICIENT & PREPARED FOR SUCCESS
KENTUCKY DEPARTMENT OF EDUCATION

The following are the general guides that will be used to evaluate your responses to short-answer and extended-response questions in this test.

Kentucky Short-Answer Questions General Scoring Guide

Score Point 2	• You complete all components of the question and communicate ideas clearly. • You demonstrate an understanding of the concepts and/or processes. • You provide a correct answer using an accurate explanation as support.
Score Point 1	• You provide a partially correct answer to the question and/or address only a portion of the question. • You demonstrate a partial understanding of the concepts and/or processes.
Score Point 0	• Your answer is totally incorrect or irrelevant.
Blank	• You did not give any answer at all.

Kentucky Extended-Response Questions
General Scoring Guide

Score Point 4	• You complete all important components of the question and communicate ideas clearly. • You demonstrate in-depth understanding of the relevant concepts and/or processes. • Where appropriate, you choose more efficient and/or sophisticated processes. • Where appropriate, you offer insightful interpretations or extensions (generalizations, applications, analogies).
Score Point 3	• You complete most important components of the question and communicate clearly. • You demonstrate an understanding of major concepts even though you overlook or misunderstand some less-important ideas or details.
Score Point 2	• You complete some important components of the question and communicate those components clearly. • You demonstrate that there are gaps in your conceptual understanding.
Score Point 1	• You show minimal understanding of the question. • You address only a small portion of the question.
Score Point 0	• Your answer is totally incorrect or irrelevant.
Blank	• You did not give any answer at all.

KENTUCKY MATHEMATICS REFERENCE SHEET
Grades 7 and 8

FORMULAS FOR PLANE FIGURES

Parallelogram: $A = bh$

Trapezoid: $A = \frac{1}{2}(b_1 + b_2)h$

Triangle: $A = \frac{1}{2}bh$

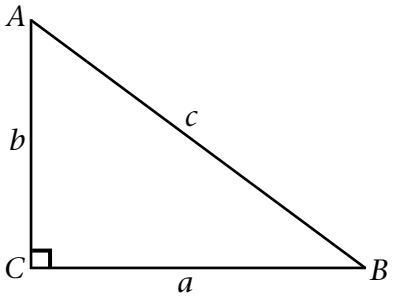
Circle: $C = 2\pi r$

$A = \pi r^2$

Right Triangle:

The Pythagorean Formula

$c^2 = a^2 + b^2$



FORMULAS FOR SOLID FIGURES

Right Prism: $V = Bh$ (B is the area of the base.)

Right Cylinder: $V = \pi r^2 h$

Regular Pyramid: $V = \frac{1}{3}Bh$

Cube: $V = e^3$

$SA = 6e^2$

Cone: $V = \frac{1}{3}\pi r^2 h$

Sphere: $V = \frac{4}{3}\pi r^3$

1

Each of four groups in Ms. Myer's class conducted the same experiment with an 8-sided polyhedron. Each side of the polyhedron is labeled with one number from 1 through 8. Each group rolled the polyhedron 100 times. The results are shown in the table.

Results

Group	Number on Polyhedron							
	1	2	3	4	5	6	7	8
F	13	7	15	16	14	12	9	14
G	7	17	16	18	8	13	8	13
H	12	14	10	11	10	16	18	9
J	16	11	8	15	12	10	11	17

Which group is closest to the theoretical probability that the number 4 lands face up?

A F
B G
C H
D J

2

Bridget has a coupon for 30% off the regular price of one item at a bicycle store. She buys a bicycle that has a regular price of $139.99. The tax rate is 6%. What is the price of the bicycle after the coupon is used and tax is applied?

A $103.87
B $106.39
C $137.05
D $139.75

3

Richard is playing a video game that helps him learn multiplication facts. The table shows data about points he earned on the first two levels of the game.

Video Game Scores

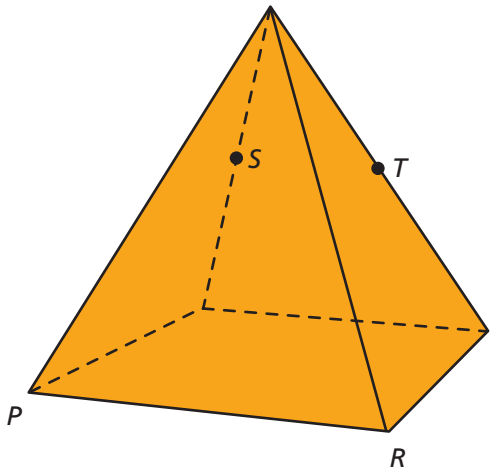
Level	Points per Correct Answer	Bonus for Completion of Level	Total Score for Level
1	20	50	390
2	25	100	450

How many questions total did Richard answer correctly for both levels?

A 15
B 22
C 31
D 44

4

The right square pyramid below shows vertices P and R of the base. Points S and T are the midpoints of the two edges that do not have P and R as endpoints.

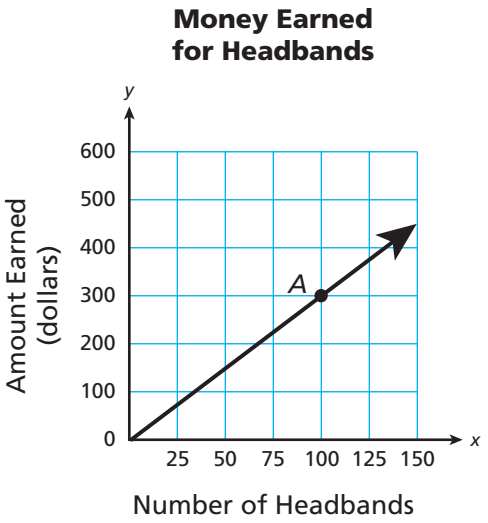


Which figure is created by the intersection of the pyramid and a plane that includes points P, R, S, and T?

A Square
B Trapezoid
C Rectangle
D Rhombus

5

Sarah sold flowered headbands at a festival to earn extra money. The graph below represents her earnings.



Which information does point A represent?

A Sarah earned $0.25 for each headband she sold.
B Sarah earned $1.00 for each headband she sold.
C Sarah earned $100 by selling 300 headbands.
D Sarah earned $300 by selling 100 headbands.

6

A school cafeteria makes 4 different salads during the week but serves only 2 each day on a rotating basis. The 4 salads are listed below.

- Chicken (C)
- Fruit (F)
- Pasta (P)
- Tuna (T)

Part A Use the letters C, F, P, and T to list all outcomes of 2 salads.

Part B A student randomly chooses a day to buy a cafeteria salad without knowing which 2 salads are being served. What is the probability the student chooses a day the cafeteria is serving chicken salad, pasta salad, or both? Show your work or explain your thinking.

RUBRIC	
Score Point 2	• You complete all components of the question and communicate ideas clearly. • You demonstrate an understanding of the concepts and/or processes. • You provide a correct answer using an accurate explanation as support.
Score Point 1	• You provide a partially correct answer to the question and/or address only a portion of the question. • You demonstrate a partial understanding of the concepts and/or processes.
Score Point 0	• Your answer is totally incorrect or irrelevant.
Blank	• You did not give any answer at all.
Note: No part can be incomplete or incorrect and receive full credit.	

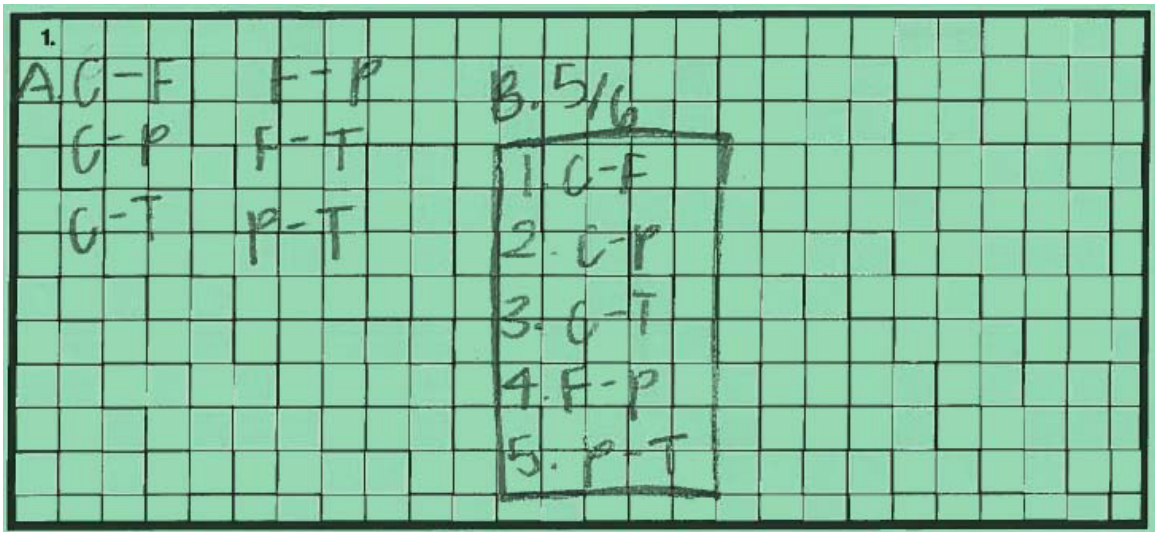
Correct Answer

Part A
CF, CP, CT, FP, FT, PT

Part B
The cafeteria serves chicken salad, pasta salad or both for 5 of the 6 possible combinations so the probability would be $\frac{5}{6}$ or about 0.83 or 83% .

Annotated Student Response

SAMPLE 2-POINT RESPONSE



ANNOTATION – 2-POINT RESPONSE

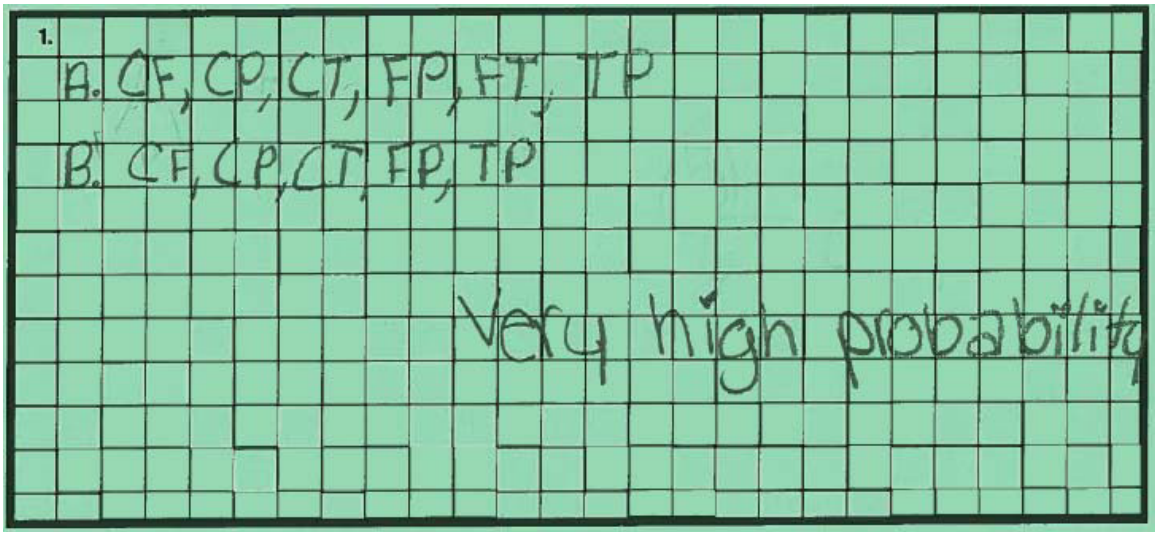
Student correctly lists six correct outcomes.

Student provides the correct probability (fraction) with explanation

Overall, the student earns 2 points.

Annotated Student Response

SAMPLE 1-POINT RESPONSE



ANNOTATION – 1-POINT RESPONSE

Student demonstrates partial understanding.

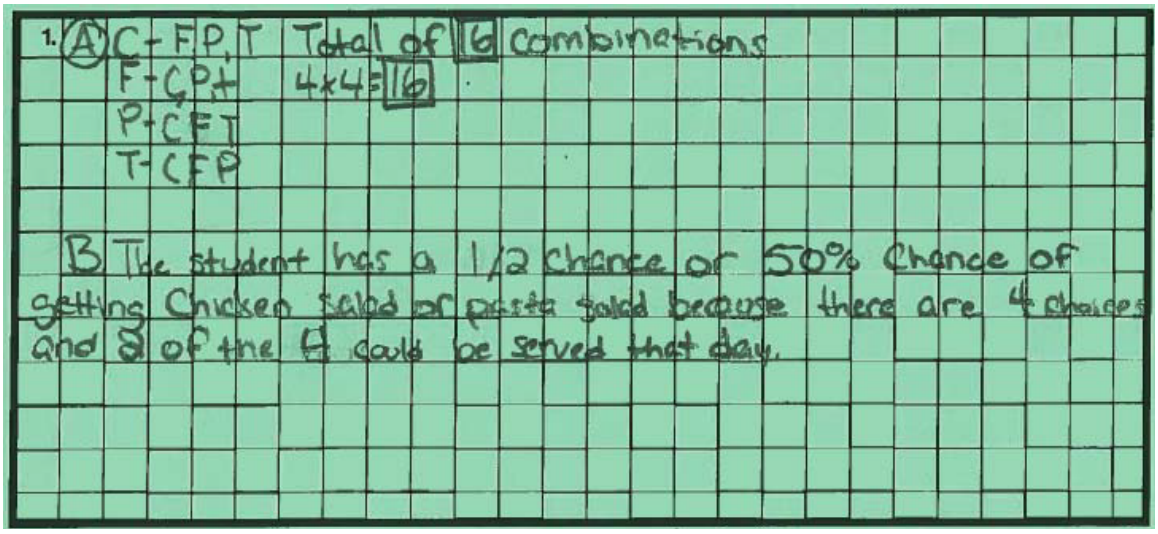
Student correctly lists six correct outcomes.

Student does not provide the correct probability but shows some work.

Overall, the student earns 1 point.

Annotated Student Response

SAMPLE 0-POINT RESPONSE



ANNOTATION – 0-POINT RESPONSE

Student lists no correct outcomes.

Student provides an incorrect probability with incorrect explanation.

Overall, the student earns 0 points.

7

Using your ruler, draw ΔXYZ so that it has the side lengths listed below. The measure of $\angle X = 45°$. Be sure to label your triangle.

- $\overline{XY} = 2$ inches
- $\overline{YZ} = 2\frac{1}{2}$ inches
- $\overline{ZX} = 3\frac{1}{2}$ inches

Using your protractor, determine the angle measures of $\angle Y$ and $\angle Z$. Be sure to label the angle measures.

RUBRIC	
Score Point 2	• You complete all components of the question and communicate ideas clearly. • You demonstrate an understanding of the concepts and/or processes. • You provide a correct answer using an accurate explanation as support.
Score Point 1	• You provide a partially correct answer to the question and/or address only a portion of the question. • You demonstrate a partial understanding of the concepts and/or processes.
Score Point 0	• Your answer is totally incorrect or irrelevant.
Blank	• You did not give any answer at all.
Note: No part can be incomplete or incorrect and receive full credit.	

Correct Answer

Part A Student draws ΔXYZ with side lengths 2 inches, $2\frac{1}{2}$ inches, and $3\frac{1}{2}$ inches, accordingly.

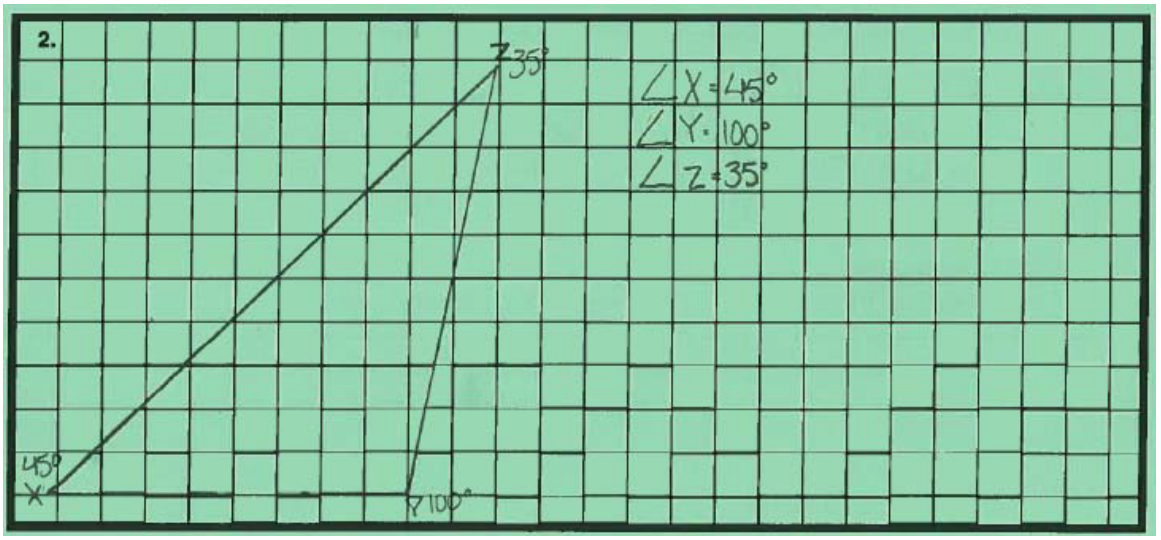
Part B The measures of the two angles should be close to $\angle Y = 100°$ and $\angle Z = 35°$.

Note on student response images:

Due to file editing and formatting, image reproduction may not be true to scale, and student drawings may have their dilation affected.

Annotated Student Response

SAMPLE 2-POINT RESPONSE



ANNOTATION – 2-POINT RESPONSE

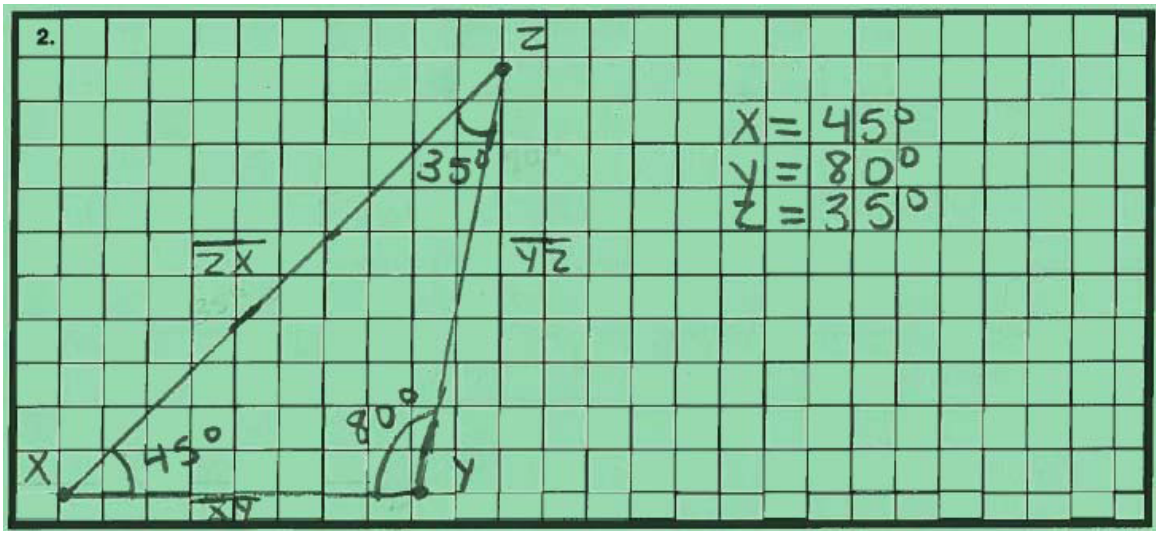
Student correctly draws triangle *XYZ* and labels it.

Student correctly determines the measures of angle *Y* and angle *Z*

Overall, the student earns 2 points.

Annotated Student Response

SAMPLE 1-POINT RESPONSE



ANNOTATION – 1-POINT RESPONSE

Student demonstrates partial understanding.

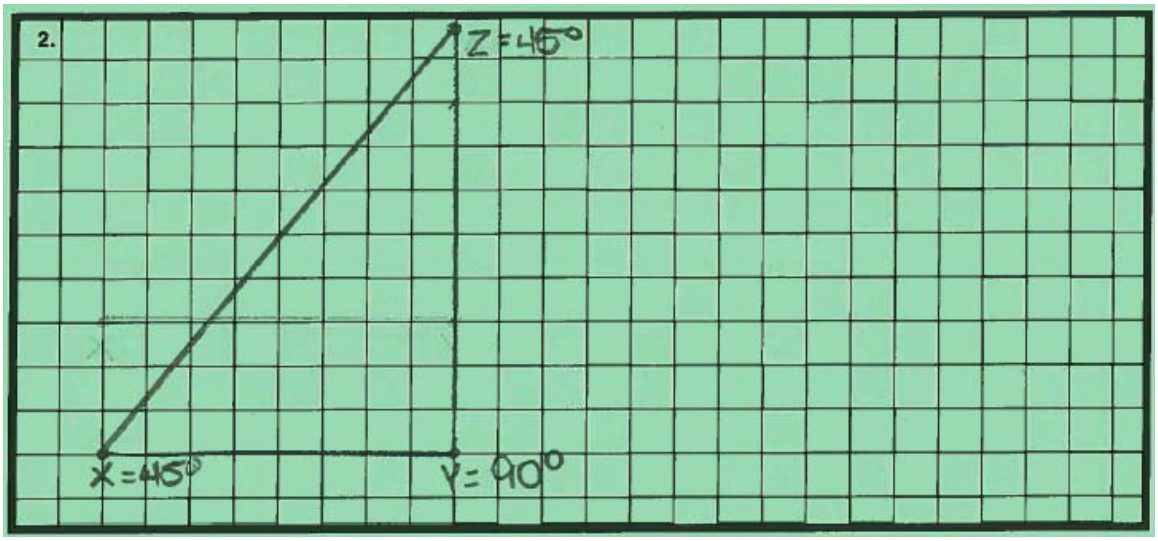
Student correctly draws triangle *XYZ* and labels it.

Student correctly determines the measure of angle *Z*. Angle *Y* is incorrect.

Overall, the student earns 1 point.

Annotated Student Response

SAMPLE 0-POINT RESPONSE



ANNOTATION – 0-POINT RESPONSE

Student incorrectly draws triangle *XYZ* and labels it.

Student incorrectly determines the measures of angle *Y* and angle *Z*

Overall, the student earns 0 points.

8

Part A On your answer document, draw a coordinate plane that uses only Quadrant 1. Label the *x*-axis and the *y*-axis on the grid. Plot the points (3, 2) and (9, 6). Then, draw a line through the points so that the line extends to the edges of your coordinate plane.

Part B Write each given point as a ratio and show how the ratios are proportional. Show your work and explain your thinking.

Part C What does your line indicate about the proportionality of the two points in relation to the origin? Explain your thinking.

Part D Write a different point that is proportional to (9, 6). Explain how you determined the point.

RUBRIC	
Score Point 4	Student scores 4 points.
Score Point 3	Student scores 3 – 3.5 points.
Score Point 2	Student scores 2 – 2.5 points.
Score Point 1	Student scores 0.5 – 1.5 points. OR Student demonstrates minimal understanding of quantities in a proportional relationship.
Score Point 0	Student's response is totally incorrect or irrelevant.
Blank	No student response.
Note: No part can be incomplete or incorrect and receive full credit.	

Score Points

Part A score 1 point correctly sketches a graph with points (3, 2) and (9, 6).
OR
score 0.5 point correctly sketches part of the graph
OR
some correct procedure

Part B score 1 point correct answer with explanation
OR
score 0.5 point correct answer with incomplete explanation
OR
vague explanation only

Part C score 1 point correct answer with correct and complete work or explanation
OR
score 0.5 point correct answer with incomplete work or explanation
OR
incorrect answer due to a calculation error (work must be shown)
OR
some correct procedure
OR
vague explanation only

Part D score 1 point correct answer with correct and complete work or explanation
OR
score 0.5 point correct answer with incomplete work or explanation
OR
some correct procedure
OR
vague explanation only

Correct Answer:

Part A Student draws a correct coordinate plane with a line passing through the points $(0,0),(3,2),(6,4),(9,6)$

Part B $\frac{3}{2};\frac{9}{6}$

$\frac{3}{2}=\frac{9}{6}$; $9\times 2=3\times 6;18=18$

OR

When the two points are set up as a ratio, the two points are proportional if the values of the cross-multiplication are equal.

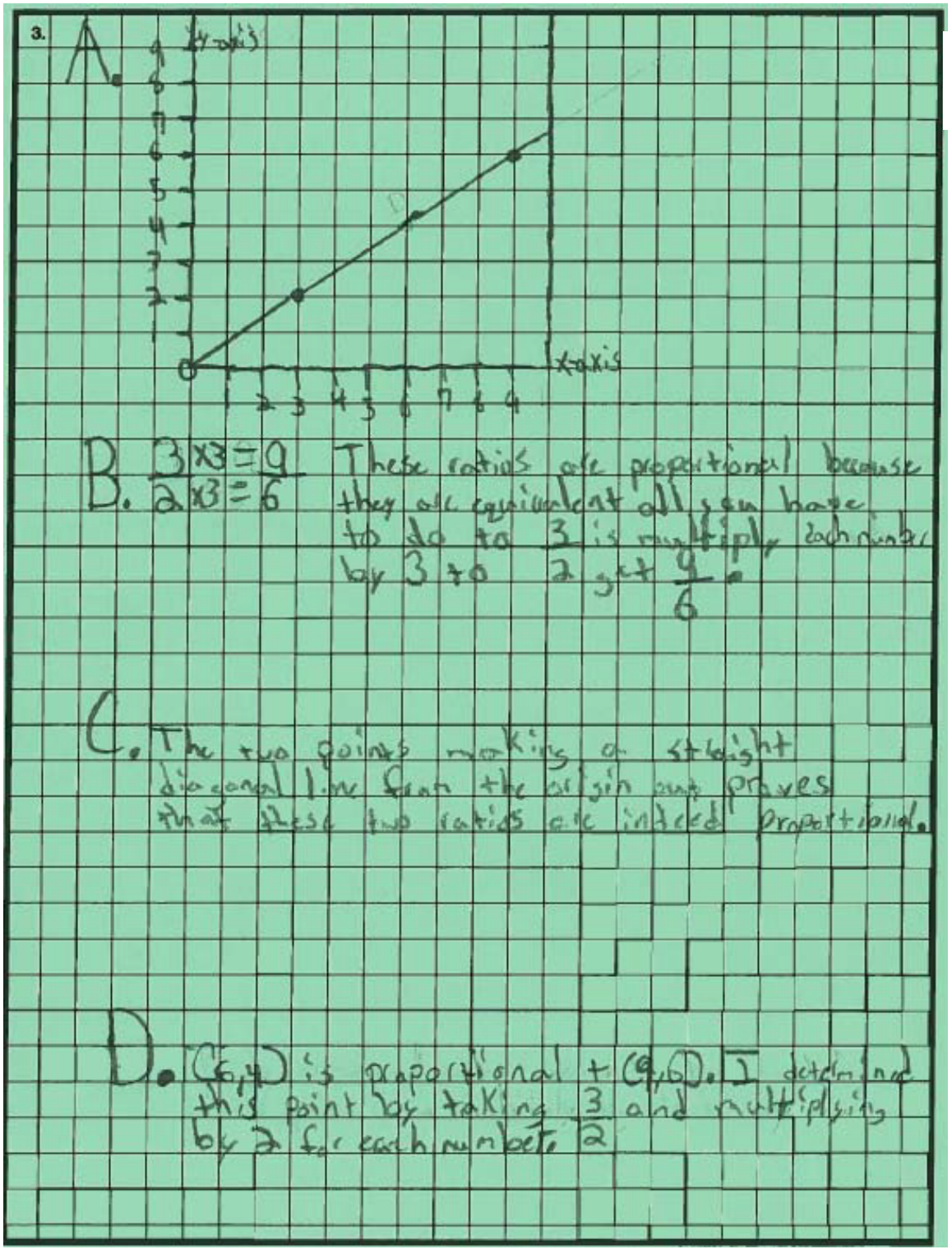
Part C If the line passes through the two points *and* the origin, then they are proportional.

OR similar explanation

Part D $(6,4)$ and $(^{-}3,^{-}2)$ are two of several possible points. $\frac{9}{6}=\frac{6}{4}=\frac{^{-}3}{^{-}2}$; $6\times 6=9\times 4$; $9\times ^{-}2=6\times ^{-}3$

Annotated Student Response

SAMPLE 4-POINT RESPONSE **NOTES**



A 1.0

B 1.0

C 1.0

D 1.0

ANNOTATION - 4-POINT RESPONSE

A The student correctly draws a coordinate plane with labels and correctly plotted points with a line drawn through both points and the origin. (1 point)

B The student writes each point as a ratio and shows how they are proportional. (1 point)

C The student provides an explanation about the proportionality of the two points in relation to the origin. (1 point)

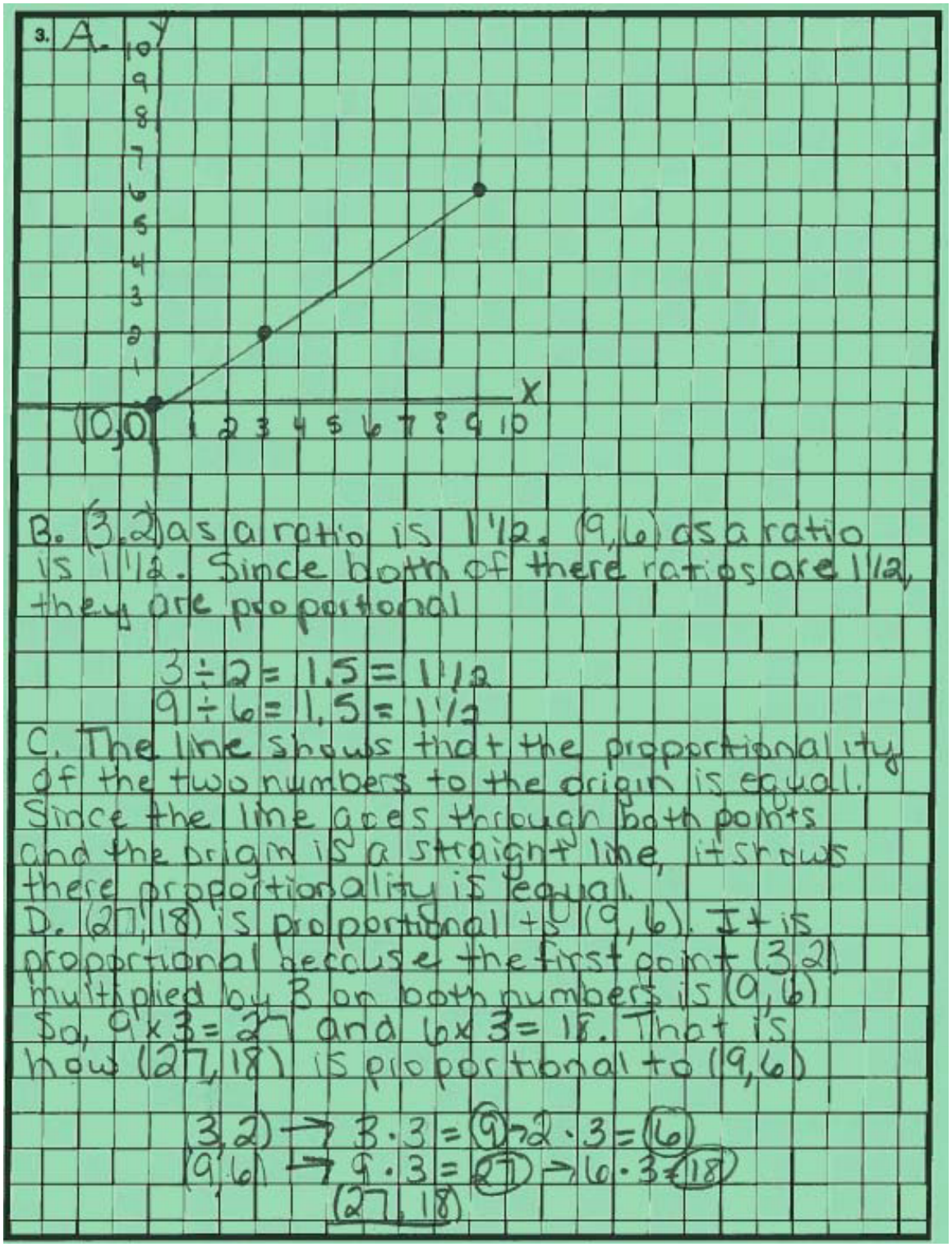
D The student writes a different point proportional to (9,6) with an explanation of how the point was determined. (1 point)

Overall, the student earns 4 points.

Annotated Student Response

SAMPLE 3-POINT RESPONSE

NOTES



A 1.0

B 0.5

C 1.0

D 1.0

ANNOTATION - 3-POINT RESPONSE

A The student correctly draws a coordinate plane with labels and correctly plotted points with a line drawn through both points and the origin. (1.0 point)

B The student does not write each point as a ratio but shows how they are proportional. (0.5 points)

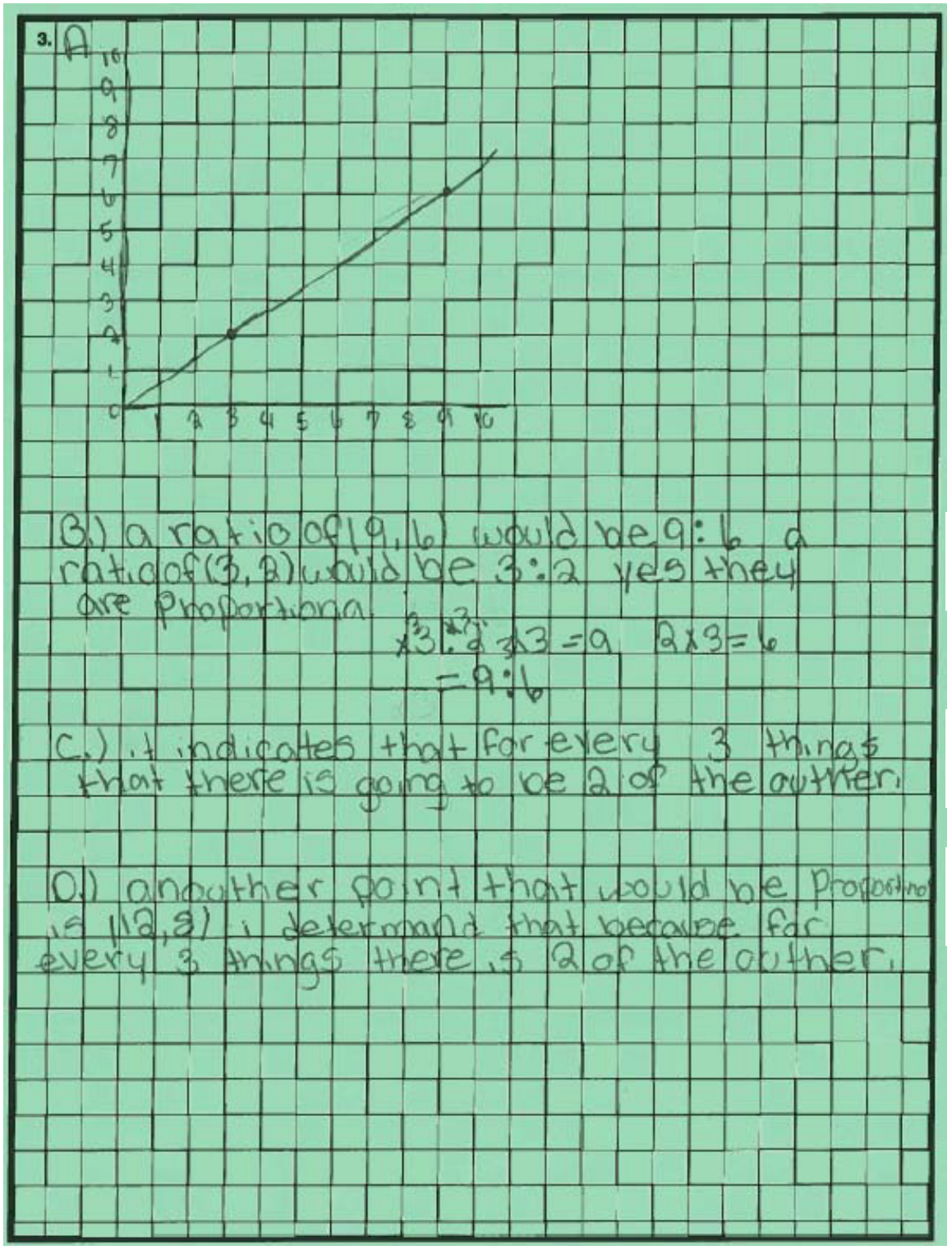
C The student provides an explanation about the proportionality of the two points in relation to the origin. (1.0 point)

D The student writes a different point proportional to (9,6) with an explanation of how the point was determined. (1.0 point)

Overall, the student earns 3.5 points.

Annotated Student Response

SAMPLE 2-POINT RESPONSE **NOTES**



A .5

B 1.0

C 0.0

D 1.0

ANNOTATION - 2-POINT RESPONSE

A The student correctly draws a coordinate plane without labels. The student correctly plots the points with a line drawn through both points and the origin. (0.5 points)

B The student writes each point as a ratio and shows how they are proportional. (1.0 points)

C The student provides an incorrect explanation of what the line indicates about the proportionality of the two points in relation to the origin. (0.0 points)

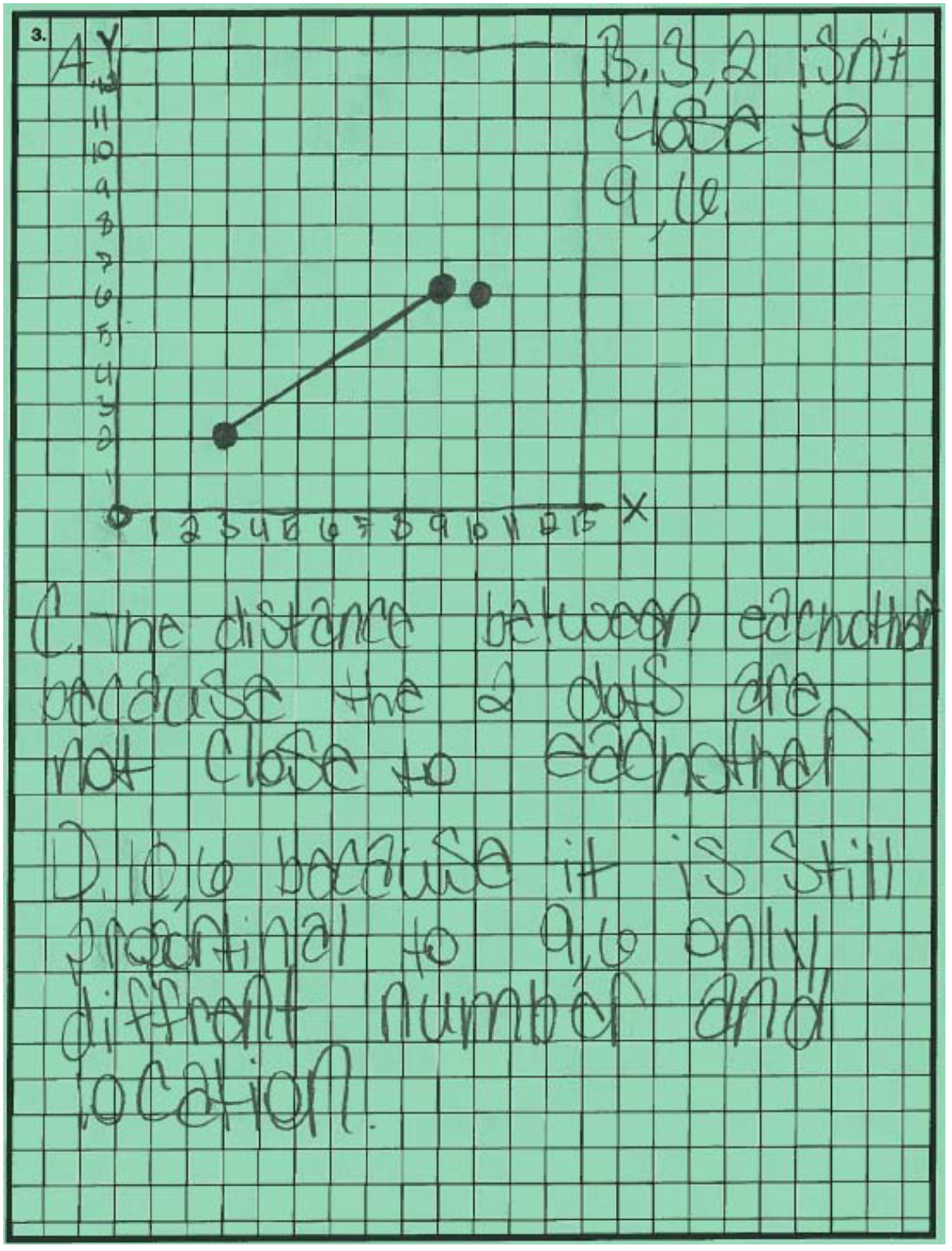
D The student writes a different point proportional to (9,6) with an explanation of how the point was determined. (1 point)

Overall, the student earns 2.5 points.

Annotated Student Response

SAMPLE 1-POINT RESPONSE

NOTES



A 0.5

B 0.0

C 0.0

D 0.0

ANNOTATION - 1-POINT RESPONSE

A The student correctly draws a coordinate plane with labels. The student correctly plots the points with a line segment drawn between the two points. (0.5 points)

B The student does not write each point as a ratio and does not show how they are proportional. (0 points)

C The student provides an incorrect explanation of what the line indicates about the proportionality of the two points in relation to the origin. (0 points)

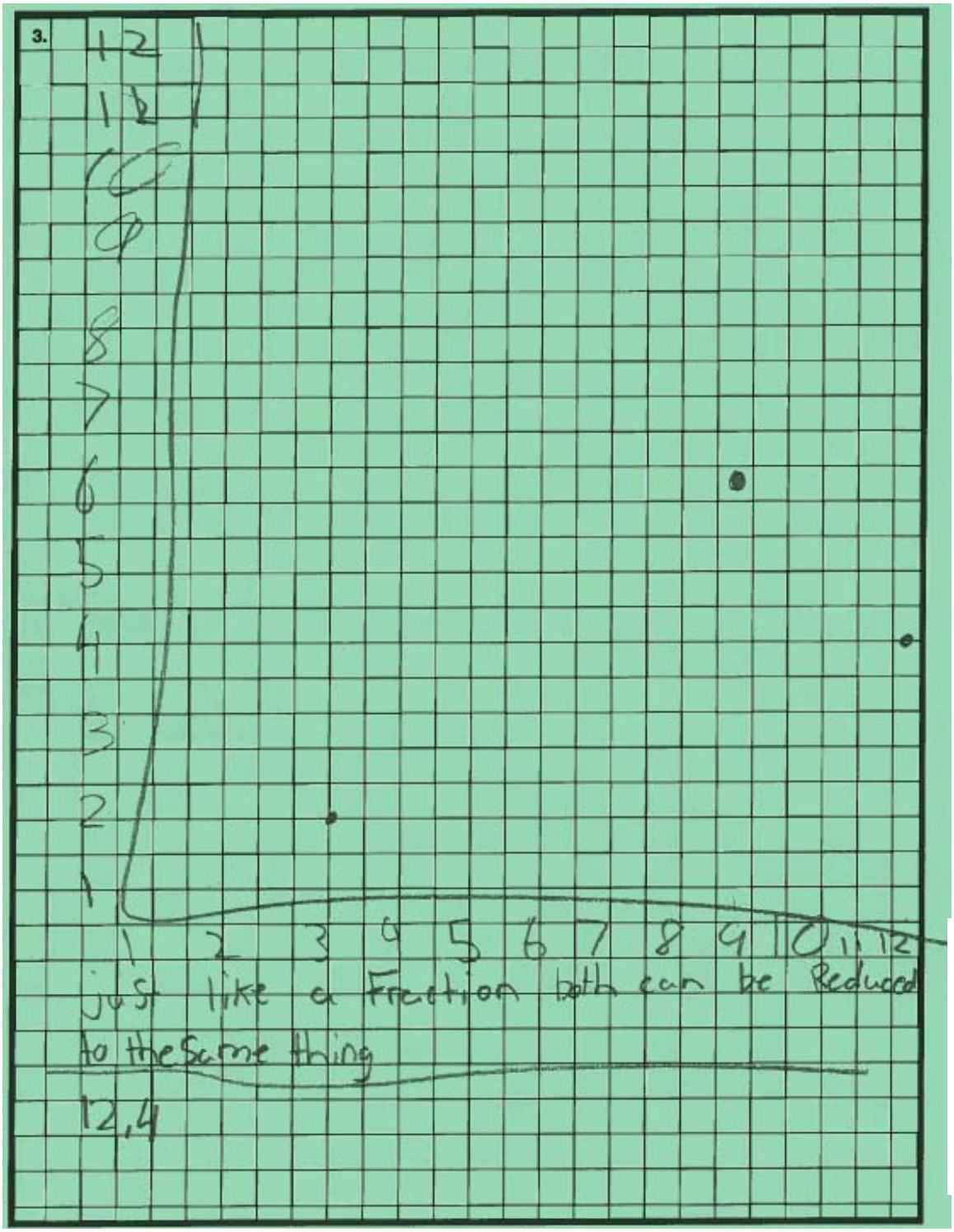
D The student writes a different point which is not proportional to (9,6) with an irrelevant explanation for how the point was determined. (0 points)

Overall, the student earns 0.5 points.

Annotated Student Response

SAMPLE 0-POINT RESPONSE

NOTES



A 0.0

B 0.0

C 0.0

D 0.0

ANNOTATION - 0-POINT RESPONSE

A The student incorrectly draws a coordinate plane without labels. (0 points)

B The student does not write each point as a ratio and does not show how they are proportional. (0 points)

C The student does not provide an explanation of what the line indicates about the proportionality of the two points in relation to the origin. (0 points)

D The student writes a different point which is not proportional to (9,6) and provides no explanation of how the point was determined. (0 points)

Overall, the student earns 0 points.

Item Information

Question Number	Key	DOK*	KCAS Primary Standard**
1	C	2	7.SP.6
2	A	2	7.RP.3
3	C	2	7.EE.4a
4	B	2	7.G.3
5	D	2	7.RP.2d
6	NA	2	7.SP.7
7	NA	2	7.G.2
8	NA	3	7.RP.2a

*DOK is the abbreviation for Depth of Knowledge. Please note that DOK is associated to the complexity level of an assessment item and is not aligned to the standard. Further information regarding DOK can be accessed on the Kentucky Department of Education website: http://www.education.ky.gov/kde/instructional+resources/curriculum+documents+and+resources/core+content+for+assessment/core+content+for+assessment+4.1/content+specific+core+content+for+assessment+dok+support+materials.htm.

**Further information regarding Common Core Standards can be accessed on the Common Core website: http://www.corestandards.org.